WASHINGTON STATE DEPARTMENT OF ECOLOGY

Water Quality Program

Municipal Wastewater Treatment Plants

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Chapter 90.48 RCW, Water Pollution Control:

- The policy of the state of Washington is to maintain the highest possible standards to insure the purity of all waters of the state and require the use of all known available and reasonable methods to prevent and control the pollution of waters of the state.

- Waters of the state include lakes, rivers, ponds, streams, inland waters, underground waters, salt waters and all other surface waters and watercourses within the jurisdiction of the state of Washington.

Municipal Sewage Treatment Plants:

- All facilities that discharge wastewater to waters of the state (surface or ground water) must be permitted.
- Permits must be renewed/revised at least every five years.

Sewage Treatment Plants must meet

- **Technology based treatment standards,**

AND

- **Water Quality Based Standards**:

Technology based treatment standards

Pollutant Parameter	30-day Average Concentration	7-day Average Concentration
Biological Oxygen Demand (BOD5)	30 mg/L	45 mg/L
Total Suspended Solids (TSS)	30 mg/L	45 mg/L
Fecal Coliform (geometric means)	200 organisms/ 100 mL	400 organisms/ 100 mL
pH	6-9 standard units	

30-day average percent removal for BOD5 and TSS shall not be less than 85%.

Water Quality Based Standards

If technology based treatment results in discharges that cause violations of

- Surface water quality standards (Ch 173-201A WAC)

OR

- Ground water quality standards (Ch 173-200 WAC)

The sewage must be treated to higher standards that will protect the water quality.

Surface Water Quality Standards (Ch 173-201A WAC)

Hood Canal-Class AA (extraordinary):

Fecal Coliform: less than 14 colonies/100mL

Dissolved Oxygen: more than 7.0 mg/L

Temperature: less than 13°C

pH: between 6.5 to 8.5

Toxic, Radioactive or deleterious materials may not impair the most sensitive biota, or public health.

Aesthetic values shall not be impaired.

Ground Water Quality Standards

Ground Water is protected as potential Drinking Water.
The standard is the lowest concentration of:
Ch 246-290 WAC, Public Water Systems MCLs, or
Ch 173-200 WAC, Ground Water Quality Criteria.

Fecal Coliform:	0 colonies/100 mL
Nitrate:	less than 10 mg/L
Manganese:	less than 50 mg/L
Lead:	less than 50 mg/L
Vinyl chloride:	less than 0.02 ug/L

MONITORING

All water quality permits include monitoring and reporting requirements to ensure that permit limits are met.

S2. MONITORING REQUIREMENTS

A. Monitoring Schedule

1. Outfall 001 West Point

Compliance Monitoring

Parameter	Units	Sample Point	Minimum Sampling Frequency	Sample Type
Flow	MGD	Final Effluent	Continuous*	Measurement
BOD_5[a]	mg/l	Influent	Weekly	24-hr. Comp.
$CBOD_5$	mg/l	Influent	Daily	24-hr. Comp.
		Final Effluent[1]	Daily	24-hr. Comp.
TSS	mg/l	Influent	Daily	24-hr. Comp.
		Final Effluent	Daily	24-hr. Comp.
pH	Standard Units	Final Effluent	Continuous*	Measurement
Total Residual Chlorine	µg/l	Chlorinated Effluent[2]	Continuous*	Measurement
		Final Effluent[3]	Continuous*	Measurement
Fecal Coliform	#/100ml	Final Effluent	Daily[4]	Grab

[a] BOD_5 is required for the purpose of comparing to the influent design criteria.

Pretreatment Monitoring

Parameter	Sample Point	Minimum Sampling Frequency	Sample Type
Priority Pollutants Metals 40 CFR Part 503 metals for biosolids	Influent	Quarterly[5,6]	24-hr. Comp.
	Final Effluent	Quarterly[5,6] concurrently with influent sampling	24-hr. Comp.
	Biosolids	Quarterly[5,6]. One (1) taken within 3-8 days after influent sample.	Grab
Oil & Grease	Influent	Quarterly[6]	Grab[7]
	Final Effluent	Quarterly[6] concurrently with influent sampling	Grab[7]
Cyanide	Influent	Quarterly[6]	Grab
	Final Effluent	Quarterly[6] concurrently with influent sampling	Grab
	Biosolids	Quarterly[6]. One (1) taken within 3-8 days after influent sample.	Grab

Parameter	Sample Point	Minimum Sampling Frequency	Sample Type
pH	Influent	Quarterly[6]	Grab
	Final Effluent	Quarterly[6] concurrently with influent sampling	Continuous Measurement
	Biosolids	Quarterly[6]. One (1) taken within 3-8 days after influent sample.	Grab
Priority Pollutants Organics	Influent	Annually[6]	24-hr. Comp.
	Final Effluent	Annually[6] concurrently with influent sampling	24-hr. Comp.
	Biosolids	Annually[6]. One (1) taken within 3-8 days after influent sample.	Grab
Total Phenols	Influent	Quarterly[6]	Manual Comp.[7]
	Final Effluent	Quarterly[6]	Manual Comp.[7]
	Biosolids	Quarterly[6]. One (1) taken within 3-8 days after influent sample.	Grab
Other toxic pollutants likely to be present	Influent	Annually[6]	24-hr. Comp.
	Final Effluent	Annually[6] concurrently with influent sampling	24-hr. Comp.
	Biosolids	Annually[6]. One (1) taken within 3-8 days after influent sample.	Grab

Untreated Discharges

- Emergency Discharges

- Combined Sewage Overflow (CSO)

Emergency Discharges

Generally caused by uncontrollable incidents:

- Pipe breaks
- Clogged lines
- Equipment failures
- Power failures

Discharges must be reported to Ecology and immediate action is required to controlled and cleanup.

Combined Sewer Overflows

- Combined Sewer Systems are wastewater collection systems designed to carry sanitary sewage and stormwater in a single pipe to the treatment facility.

Combined Sewer Overflows (CSO)

- During large storms the total wastewater flow can exceed the capacity of the pipe or treatment plant.
- Untreated sewage and stormwater overflow directly to nearby surface water.

Combined Sewer Overflows

- Eleven municipalities in Washington have combined sewer systems.
- All are required to have plans and take steps that reduce the quantity and number of overflows.

CSO Project	Project Description	Capital Cost 1998 $mil	Year Controlled
Completed 1988 Plan Projects		$60.5	1997
Committed Projects[1]		$194.9	2004
South Magnolia	1.3 MG storage tank	$6.8	2010
SW Alaska Street	0.7 MG storage tank	$4.3	2010
Murray Avenue	0.8 MG storage	$5.1	2010
Barton Street	Pump station upgrade	$9.3	2011
North Beach	Storage tank/pump station expansion	$3.9	2011
University-Montlake	7.5 MG storage	$53.5	2015
Hanford #2	3.3 MG storage/treatment tank	$27.9	2017
West Point Improvements	Primary/secondary enhancements	$16.9	2018
Lander Street	1.5 MG storage/treatment at Hanford	$26	2019
Michigan Street	2.2 MG storage/treatment tank	$32.4	2022
Brandon Street	0.8 MG storage/treatment tank	$13.1	2022
Chelan Avenue	4 MG storage tank	$18.3	2024
Connecticut Street	2.1 MG storage/treatment tank	$31.9	2026
King Street	Conveyance to Connecticut treatment	$3.2	2026
Hanford at Rainier	0.6 MG storage tank	$3.3	2026
8th Avenue South	1.0 MG storage tank	$6.9	2027
West Michigan Street	Conveyance expansion	$0.4	2027
Terminal 115 (Pier 105)	0.5 MG storage tank	$3.9	2027
3rd Avenue West	5.0 MG storage tank	$28.3	2029
Ballard	1.0 MG storage tank	$2.9	2029
11th Avenue NW	2.0 MG storage tank	$12.9	2030

Note: [1]Includes Harbor, Denny, Dexter, Norfolk, and Henderson/MLK Way

Combined Sewer Overflows

- New Combined Sewage Systems are not permitted.
- All new construction must have separate sanitary and storm sewers.

Combined Sewer Overflows

- Facilities are required to report overflows to the Department of Ecology
- Ecology reports all untreated discharges to EPA annually

Combined Sewer Overflows

- In 1988 the estimated average volume of untreated combined sewage overflows in Washington was 3.3 billion gallons per year.
- Today, CSOs have been reduced to approximately 1.3 billion gallons per year, in Washington.
- Continued improvements are required.

Municipal Sewage Treatment Plants:

- All Facilities must be permitted
- Water Quality Standards must be met
- Permits are revised every 5 years
- Requirements are raised, when needed, to protect Water Quality
- Facilities with CSOs are required to make improvements and reduce untreated discharges
- Treatment Plant improvements are required but must allow adequate time to make capitol improvements at a cost ratepayers can afford